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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/780,414	02/12/2001	Katsura Otaki	108598	8508

25944 7590 06/11/2003

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EXAMINER

TURNER, SAMUEL A

ART UNIT PAPER NUMBER

2877

DATE MAILED: 06/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/780,414

Applicant(s)

OTAKI, KATSURA

Examiner

Samuel A. Turner

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2,3,5,11,12,14 and 18 is/are pending in the application.
- 4a) Of the above claim(s) 18 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3 is/are allowed.
- 6) ☒ Claim(s) 2, 5, 11, 12, and 14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### Office Action

#### Restriction Requirement

Newly submitted claim 18 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claim 18 is drawn to a projection exposure apparatus which is a completely different apparatus than the point diffraction apparatus originally claimed.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 18 withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

#### Rejections Under 35 U.S.C. § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

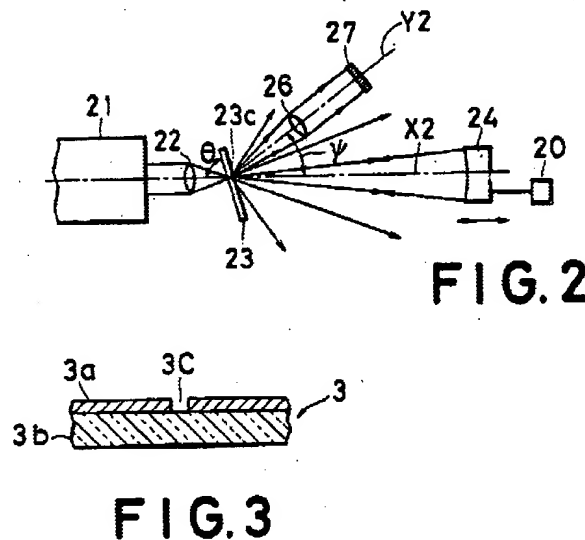
A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2, and 11 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Ichihara(5,076,695). See figures 2 and 3, and also see equation 1 which defines pinhole size.

Claim 11 is a hybrid process claim thus in regard to claim 11; the point

diffraction interferometer of Ichihara is used to manufacture multilayer film mirrors for exposure systems.



Claim 12 is rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Sommargren(5,548,403). See figures 1-7. Claim 12 is a hybrid claim and the apparatus limitations of claim 3 does not further limit the method of claim 12.

### Rejections Under 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5, and 14 are rejected under 35 U.S.C. § 103(a) as being unpatentable

over Ichihara(5,076,695) in view of Sommargren(5,548,403).

Ichihara teaches a point diffraction interferometer comprising light source(21), lens(22), pinhole mirror(23), lens under test(24), imaging lens(26), and detector array(27). See figures 2 and 3. Not taught is the use of polarized light, a single mode fiber replacing the pinhole mirror, or a multiple film pinhole mirror.

Sommargren teaches a point diffraction interferometer comprising a light source(12), filter(14),  $\frac{1}{2}$  wave plate(16), shearing interferometer(22,24,28,26), polarizer(32), lens(34), pinhole mirror(36), lens under test(50), imaging lens system(52,54,56), and detector array(58). See figure 1. In figure 2B the pinhole mirror it taught comprising substrate(38), first reflective surface(40) having the pinhole(42) and a second reflective film(44). Figures 4-6 teach the use of a single mode fiber(72) which replaces the pinhole mirror. Note the reflective coating(73) on the fiber end in figures 5 and 6.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the pinhole mirror of Ichihara with the pinhole mirror taught in figure 2B of Sommargren to increase the reflectivity of the pinhole mirror. While Sommargren teaches a substrate-pinhole reflective film-reflective film pinhole mirror, reversing the order of the two films would have been obvious because the resulting mirror would have been functionally equivalent to the mirror of Sommargren. The idea taught in Sommargren is to increase the reflectivity of the pinhole mirror. Claim 14 is a hybrid claim and the apparatus limitations of

claim 5 does not further limit the method of claim 14.

### Reasons for Allowability

Claim 3 is allowed in view of the prior art of record. The prior art fails to teach using elliptically polarized light.

### Response to Arguments

Applicant's arguments filed 12 May 2003 have been fully considered but they are not persuasive.

With regard to claims 2 and 11, the Ichihara reference need not teach the equation claimed but merely needs to meet the limitations claimed. The N.A. of any lens is  $N.A. = n \sin \theta$ , where  $n$  is the refractive index (usually of air) and  $\theta$  is the angle of the largest ray from the lens. To meet the limitation of claim 2 which defines the N.A. of the collective optical system,  $\lambda/\phi_{PH}$  must be  $\geq$  the numerical aperture of lens 2 in Ichihara. In Ichihara  $\lambda/\phi_{PH}$  is 633 nm/1  $\mu$ m or .633. Thus the N.A. for lens 2, which is between 0 and 1 for a lens in air merely has to be less than .633 which will be met by any standard focusing lens as a lens with a large N.A. is rare and expensive and not required by Ichihara.

With regard to claims 5 and 14, the pinhole is in the range of 1  $\mu$ m and with a chromium layer of 1000 to 2000 Å the reflectivity of the pinhole is greater than .5.

With regard to claims 11, 12, and 14, these are hybrid method claims which are not limited by apparatus limitations of the apparatus claims.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of

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time policy as set forth in 37 CFR 1.136(a).

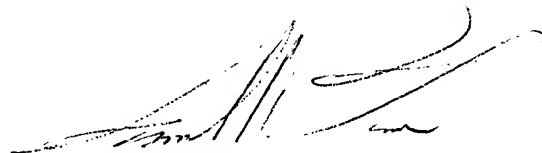
A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner whose telephone number is **(703) 308-4803**. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font, can be reached on (703) 308-4881.

The fax phone number for this Group is (703) 308-7722. The faxing of papers related to this application must conform with the notice published in the Official Gazette, 1096 O.G. 30 (15 November 1989). The Group receptionist telephone number is (703) 308-0956.

Any inquiry of a technical nature regarding reissues, petitions, and terminal disclaimers should be directed to Ed Glick whose telephone number is (703) 308-4858, Hien Phan whose telephone number is (703) 308-7502, or Ed Westin whose telephone number is (703) 308-4823.

Any other inquiry of a technical nature, and all inquiries of a general nature including those relating to the status of this application or any patent term adjustment should be directed to TC2800 Customer Service Office whose telephone number is (703) 306-3329.



Samuel A. Turner  
Primary Examiner  
Art Unit 2877

SAT  
June 10, 2003